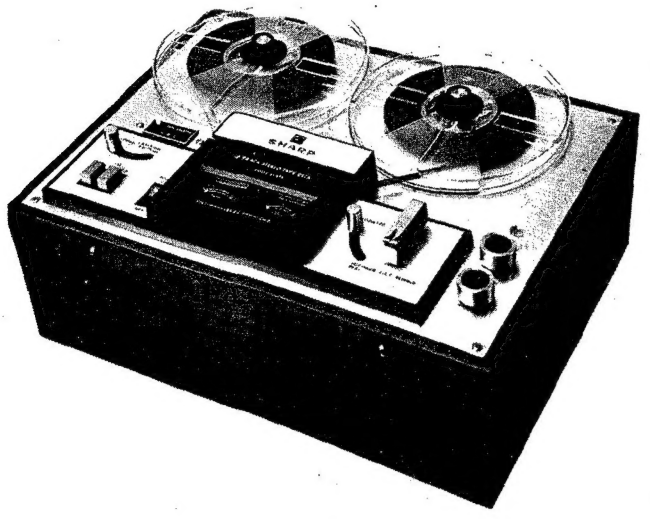
Service Manual



MODEL

RD-712

TABLE OF CONTENTS

HAYAKAWA ELECTRIC CO., LTD.

OSAKA, JAPAN

SPECIFICATIONS

Transistor Complement

Q1, Q2	(2SB-73)	·····1st Audio Amplifier
Q3, Q4	(2SB-75)	·····2nd Audio Amplifier
Q5, Q6	(2SB-77)	·····3rd Audio Amplifier
Q7, Q8	(2SB-77)	·····Audio Output
Q9, Q10	(2SB-156)	·····Bias Oscillator (Matched Pair)
Q11	(2SB-77)	·····Ripple Filter

Tape Speeds·····19, 9.5 and 4.8 cm/sec

Reel Size ·····7" maximum

Frequency Response ·····40 to 16,000 Hz at 19 cm/sec
50 to 9,000 Hz at 9.5 cm/sec
50 to 3,500 Hz at 4.8 cm/sec

Record/Playback Time

	19cm/sec	9.5cm/sec	4.8cm/sec
Stereo ·····	1 hour	2 hours	4 hours
Monaural ·····	2 hours	4 hours	8 hours

Rewind/Fast Forward Time·····Approx. 2 minutes

Power Requirements ·····AC 110/200/220/240V, 50/60 Hz

Input Circuits ·····Microphone Jack, 200 ohm
Line Input Jack, 470K ohm

Output Circuit ·····Line Output Jack, 3K ohm

Integrated Input/Output Circuit·····5 pin DIN socket

DESIGNATION OF EXT. PARTS

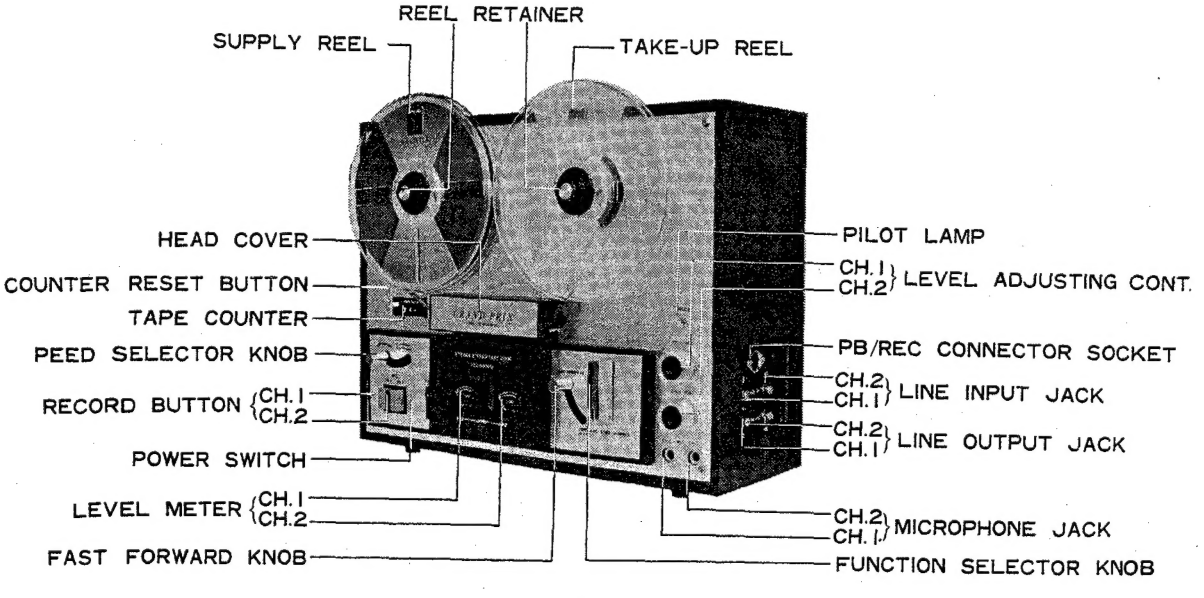


Figure 1

FUNCTION OF CONTROLS

FUNCTION SELECTOR CONTROL

The function selector is used to actuate or stop the movement of the tape and select the direction of its movement. The five operating modes are as follows. Refer to Figure 2 and Mechanism Exploded View.

(1) FORWARD PLAY (Refer to Figure 2)

Set the FUNCTION SELECTOR KNOB (87) in the FORWARD PLAY position.

1. The FUNCTION SELECTOR CAM PLATE (93) rotates so that the ROD (187) actuates the BRAKE LEVER (40 and 3) and the BRAKE PADS (39 and 2) are disengaged from the REEL SPINDLES (35 and 7).
2. Movement of the ROD (187) is transmitted to the TENSION ROLLER LEVER (38) so that the TENSION ROLLER (34) is pressed against the TAKE-UP BELT (33), the rotation of the MOTOR PULLEY (32) is transmitted to the TAKE-UP REEL SPINDLE (35) and the TAKE-UP REEL SPINDLE takes up the tape.
3. The IDLER LEVER (59) moves in the direction of the arrow cooperating the CAM PLATE (193) so that the IDLER (56) is engaged with the MOTOR PULLEY (32) and the FLY-WHEEL (121), driving the FLY-WHEEL and CAPSTAN (121).
4. The FUNCTION SELECTOR CAM PLATE (93) moves the PINCH ROLLER LEVER (47) so that the PINCH ROLLER (52) is pressed firmly against the CAPSTAN SHAFT (121) driving the tape.
5. The TAPE PADS (102) press the tape firmly against the TAPE HEADS (81 and 82) by the movement of the PINCH ROLLER LEVER (47).

(2) RECORD (Refer to Figure 2)

In order to operate this recorder in the RECORD mode, the RECORD BUTTON (155) must be depressed before the FUNCTION SELECTOR KNOB (87) is set to FORWARD PLAY position. This action causes the RECORD BUTTON to be locked in depressed position thus activating the RECORD circuits of the PRINTED CIRCUIT BOARD ASSEMBLY (202) so that erase current is applied to the ERASE HEAD (81) record bias is applied to the RECORD/PLAYBACK HEAD (82), and the output of the record circuit is applied to the LEVEL METERS (M1 and M2) for monitoring purpose.

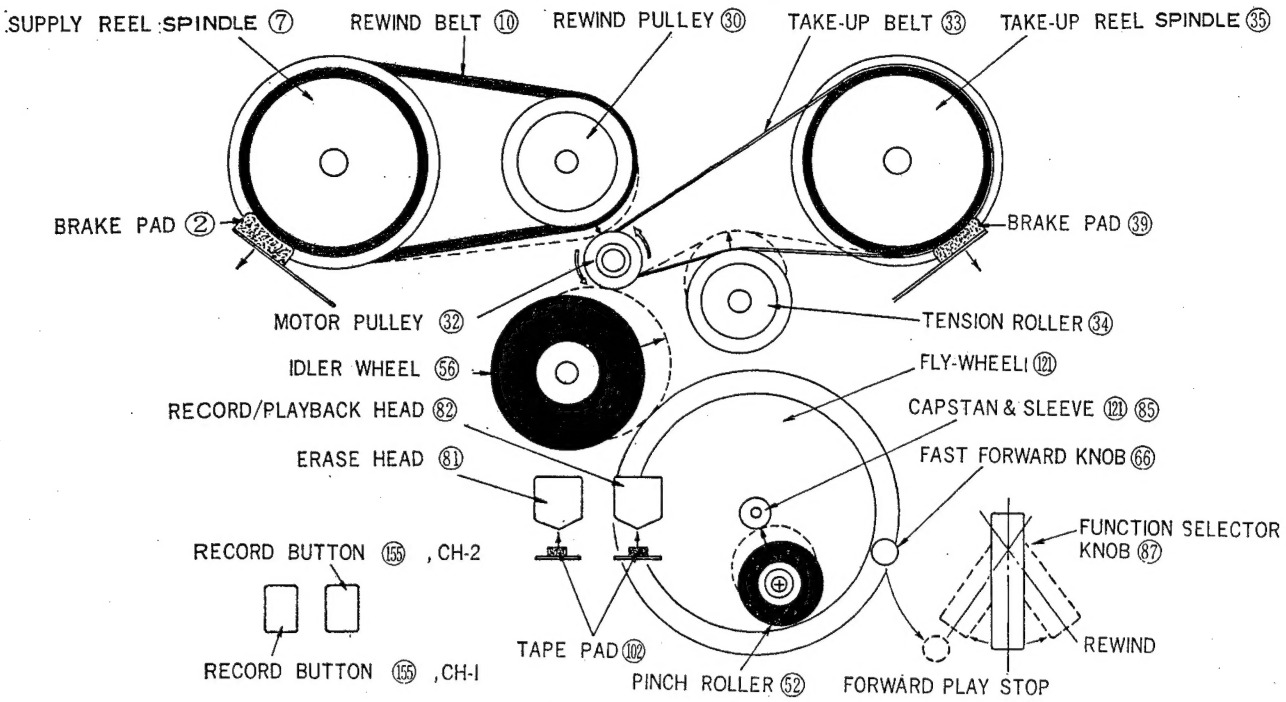


Figure 2 Tape Transport Mechanism

(3) STOP (Refer to Figure 2)

With the FUNCTION SELECTOR KNOB (87) set in this position, the BRAKE PADS (2 and 39) are pressed against the REEL SPINDLES (7 and 35), but all other mechanical functions are at idle.

(4) REWIND (Refer to Figure 2)

When the FUNCTION SELECTOR KNOB (87) is set in this position, FUNCTION CAM PLATE (93), CAM PLATES (191 and 193) and RODS (187 and 188) move in the reverse direction of the FORWARD PLAY position. The BRAKE LEVERS (3 and 40) are disengaged from the REEL SPINDLES (7 and 35), and the REWIND PULLEY (30) is pressed against the MOTOR PULLEY (32) so that the rotation of the MOTOR PULLEY (32) is transmitted to the SUPPLY REEL SPINDLE (7) through the REWIND RUBBER BELT (10) causing the SUPPLY REEL SPINDLE (7) to be driven in a clockwise direction.

Note that in this operating position, the TENSION ROLLER (34) does not engage the TAKE-UP CLOTH BELT (33), the TAPE PADS (102) and the PINCH ROLLER (52) do not engage the tape, but IDLER (56) and FLY WHEEL (121) are rotating.

(5) FAST FORWARD (Refer to Figure 2)

To increase the speed at which the tape is wound up on the TAKE-UP REEL, the FAST FORWARD CONTROL has been provided. This control may be used only when the FUNCTION SELECTOR KNOB (87) is set in the FORWARD PLAY position.

When the FAST FORWARD KNOB (66) is pushed as far to the upward as possible, the FAST FORWARD LEVER (88) is locked into position, the TENSION ROLLER (34) applies greater tension to the TAKE-UP CLOTH BELT (33), the TAPE PAD PADS (102) and the PINCH ROLLER (52) are disengaged from contact with the tape. In order to discontinue FAST FORWARD operation, the FUNCTION SELECTOR KNOB (87) must be reset to STOP position.

FUNCTION OF LEVER SWITCHES

(Refer to Figure 3 and Schematic Diagram)

(1) The LEVER SWITCH (S5) oprates as a muting switch so that the speaker doesn't sound in the REWIND, FAST FORWARD, and STOP modes.

(2) The LEVER SWITCH (S6) operates as a record safety switch. Power is supplied to the oscillating circuit in the FORWARD mode only and prevents the tape from being erased in the REWIND, and FAST FORWARD mode.

(3) The LEVER SWITCH (S4) operates as a record equalizer switch. The switch turns off when the set is put in the 7 1/2 ips (19cm/sec) speed operation and turns on when the set is put in the 3 3/4 ips (9.5cm/sec), 1 7/8 ips (4.8 cm/sec) operation.

The record equalizer circuit is changed according to the tape speed in each case.

(4) The LEVER SWITCH (S3) operates as a playback equalizer switch. When the recorder is set in the 7 1/2 ips tape speed operation, the switch turns on, in the 3 3/4 and 1 7/8 ips operation turns off. The playback equalizer circuit is changed according to the tape speed in each case.

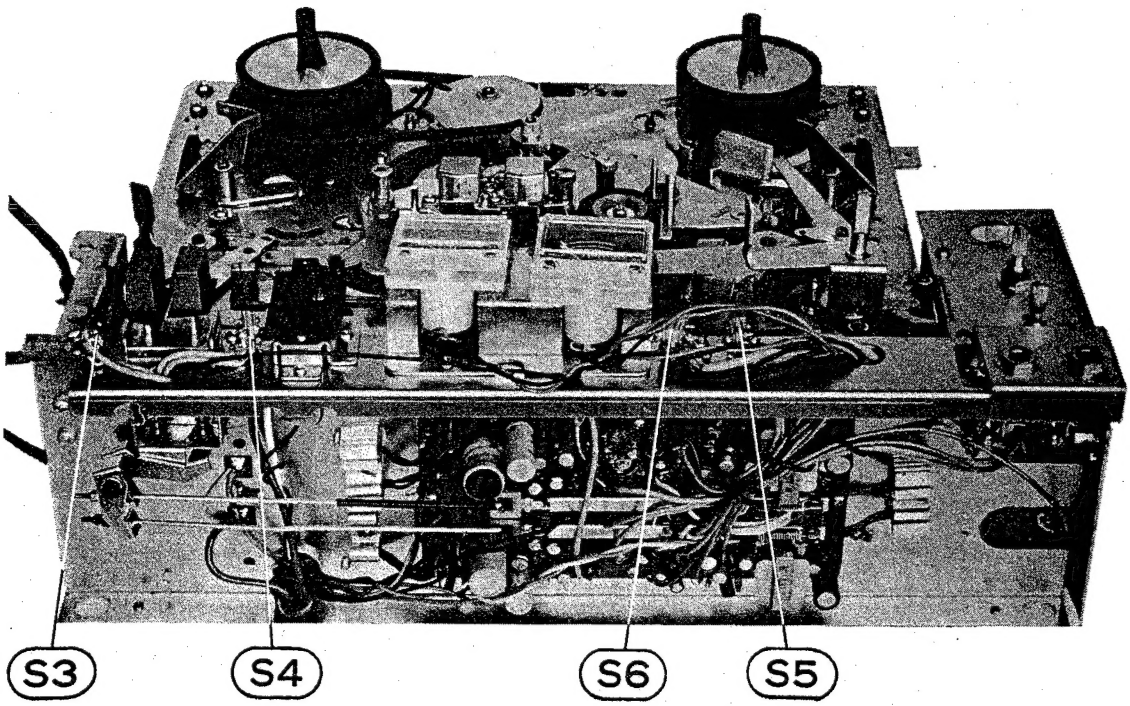


Figure 3

DISASSEMBLY PROCEDURE

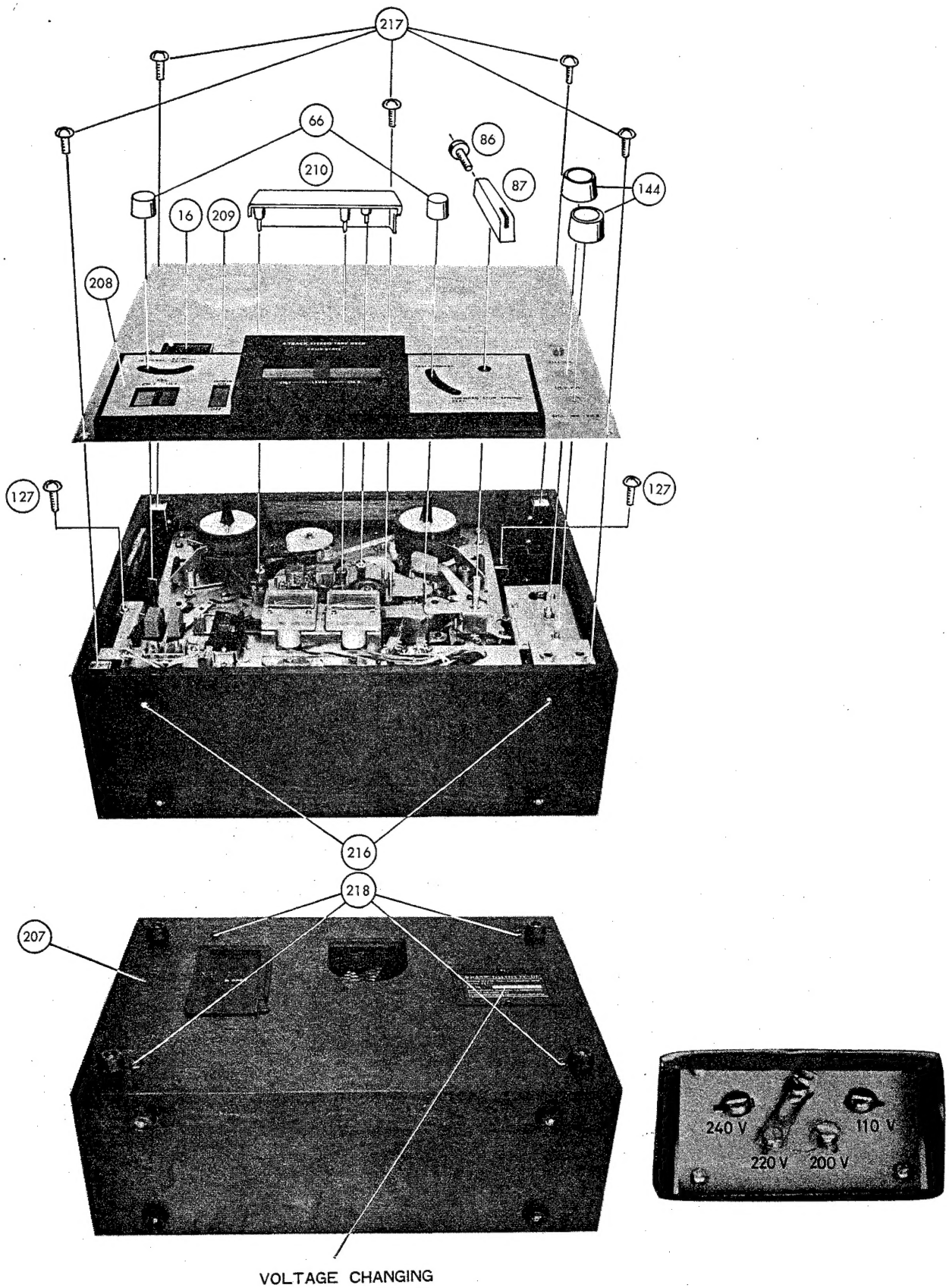


Figure 4

MECHANISM ASSEMBLY REMOVAL (Refer to Figure 4)

1. Remove the VOLUME CONTROL KNOBS (144)
2. Remove the FAST FORWARD KNOB (66) and the SPEED SELECTOR KNOB (66).
3. Remove the FUNCTION SELECTOR KNOB (87), loosening the SET SCREW (86).
4. Remove the HEAD COVER (210).
5. Remove the 5 SCREWS (217) retaining the REEL PANEL (209).
6. Remove the REEL PANEL (209) along with the DECK COVER (208).

   Caution: Remove the COUNTER BELT (15) under the TAPE COUNTER (16) provided on back of the REEL PANEL, when removing the REEL PANEL and the DECK COVER.
7. Remove the 2 SCREWS (127) retaining the MECHANISM CHASSIS on the CABINET (207).
8. Remove the 2 SCREWS (216) on the CABINET side retaining the CABINET to the MECHANISM CHASSIS.
9. Remove the 4 SCREWS (218) on the bottom of the CABINET (207) retaining the CABINET to the MECHANISM CHASSIS.

Then the mechanism assembly can be removed from the cabinet.

HEAD ASSEMBLY REMOVAL (Refer to Figure 5)

Remove the SCREW (49), then the HEAD ASSEMBLY can be removed. Disconnect the head leads, if necessary.

FLY-WHEEL ASSEMBLY REMOVAL (Refer to Figure 6)

1. Set the tape recorder to STOP position.
2. Remove the SPRING (113).
3. Remove the 3 SCREWS (94) and the one SCREW (49).

   Then the HEAD CHASSIS (95) can be removed along with the HEAD ASSEMBLY and the FLY-WHEEL (121). Disconnet the head leads, if necessary.

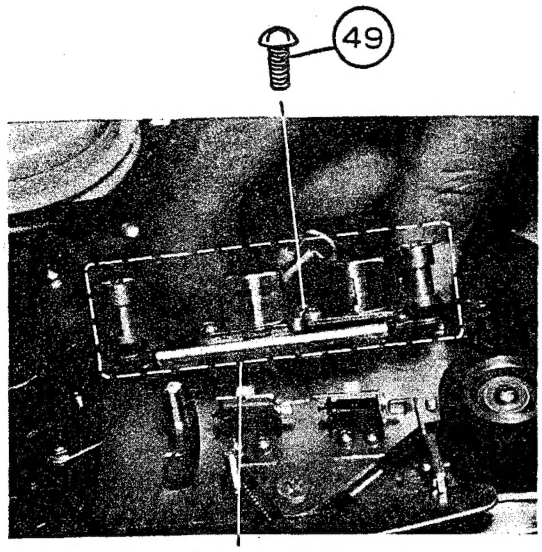
   Caution: When removing the FLY-WHEEL ASSEMBLY, take care not to lose the BALL BEARING (122) and damage the AUTOMATIC SHUT-OFF SWITCH LEVER (107).

MOTOR ASSEMBLY REMOVAL (Refer to Figure 7)

Remove the four SPECIAL SCREWS (179), then the MOTOR ASSEMBLY can be removed.

MOTOR PULLEY REMOVAL (Refer to Figure 8)

Loosen the 2 SET SCREWS (31) mounted on the MOTOR PULLEY (32) with 3 mm hex-wrench.
The Motor pulley should be changed according to the power source cycles. Index number on the motor pulley shows the power source cycles.
(Refer to the article of POWER SOURCE CYCLES CHANGING.)



HEAD ASSEMBLY

Figure 5

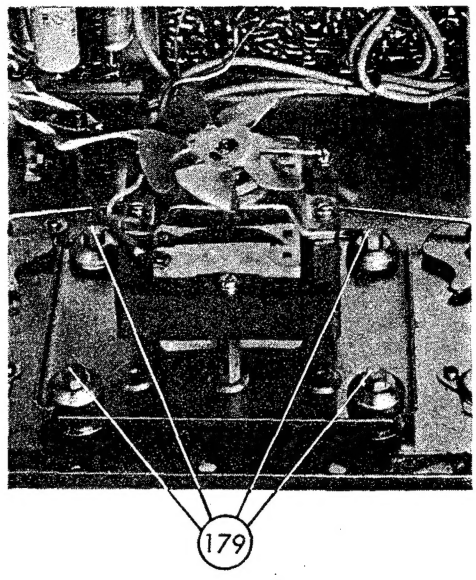
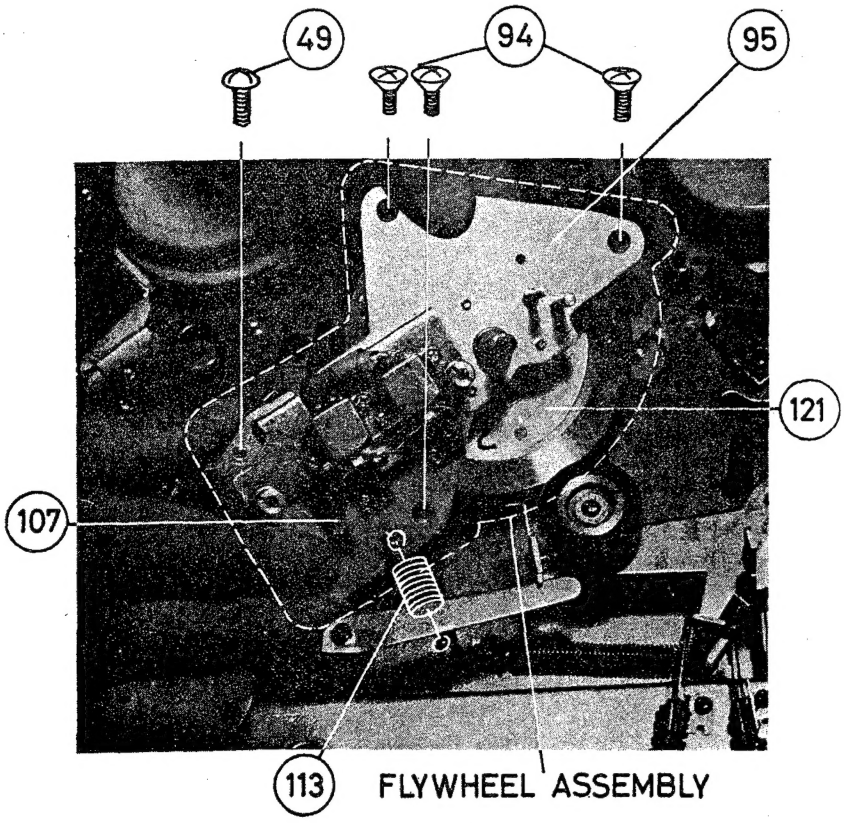
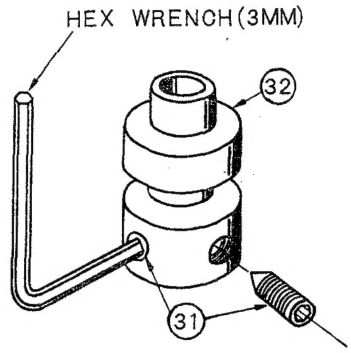


Figure 7



FLYWHEEL ASSEMBLY

Figure 6



INDEX NUMBER
FOR 60 Hz 0,1,2,3,4
FOR 50 Hz 5,6,7,8,9

Figere 8

MARK for 60 Hz			MARK for 50 Hz	
No.	SIZE of D	TAPE SPEED	SIZE of D	No.
0	7.86 mm	Slower	9.43 mm	5
1	7.96	↓ ↑	9.55	6
2	8.12		9.75	7
3	8.28		9.95	8
4	8.44	Faster	10.13	9

MECHANISM ADJUSTMENT

1. PINCH ROLLER ADJUSTMENT

(Refer to Figure 9)

A. Shaft of Pinch Roller must be parallel to Shaft of Capstan.

B. Pressure between Capstan and Pinch Roller can be checked as follows:

a. Set the recorder in "PLAY" mode with the speed set at 7 1/2 ips. (19cm/sec)

b. Hook a loop of Spring Scale at Pinch Roller Shaft and pull until Pinch Roller is disengaged from Capstan.

c. The proper pressure is between 900 and 1000 grams.

d. If pressure is not within the above range, adjust Pinch Roller Spring (53).

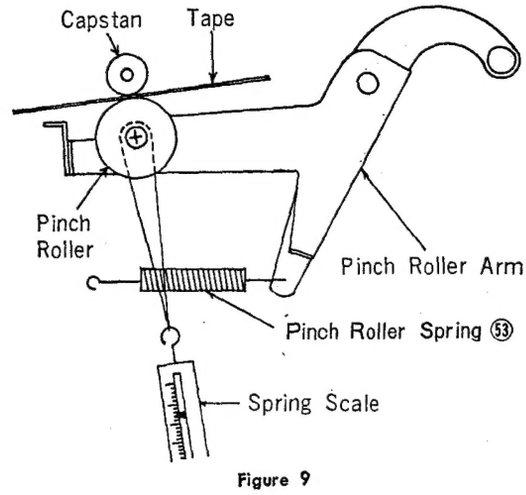


Figure 9

2. TAKE-UP TORQUE ADJUSTMENT

A. Proper Tensions are as follows: (Refer to Figure 10)

a. Forward Play mode 25~50 grams

b. Fast Forward mode 90~130 grams

c. Rewind mode 90~110 grams

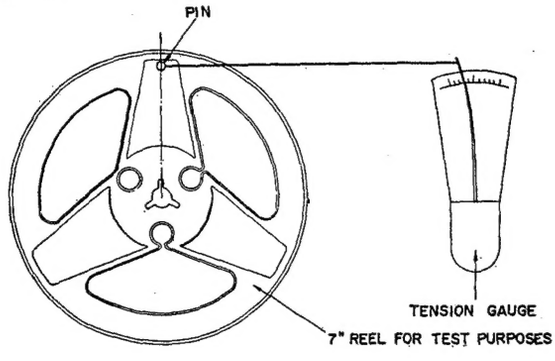


Figure 10

B. If tension is not within the above range, make the following adjustments. (Refer to Figure 11 and Figure 12)

a. If the torque is too strong, loosen or raplace Tension Roller Arm Spring (37) and if too weak, tighten or replace it.

b. If the torque is too weak, tighten or replace Fast Forward Lever Spring (89)

c. Clean oil and dust from all drive points to eliminate slippage and Slip Felt.

Especially check coupling of Rewind Belt. Adjust the torque with the Friction Spring (12) of Supply Reel Spindle.

If the torque is too strong, loosen or replace the Friction Spring; and if too weak, tighten or replace it.

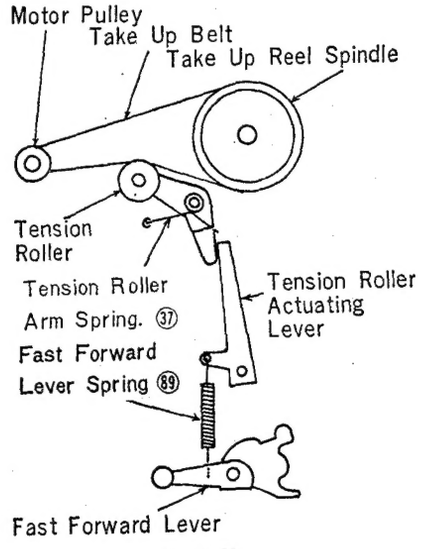


Figure 11

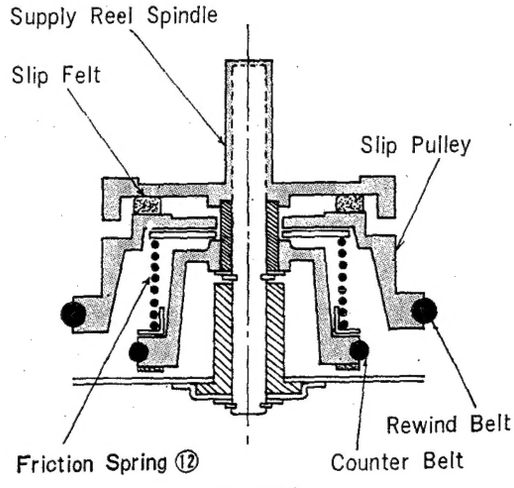


Figure 12

3. TAPE PAD PRESSURE ADJUSTMENT

(Refer to Figure 13)

A. Set the unit in "PLAY" mode.
B. Place a tention gauge at the center of Tape Pad.
C. Gradually draw Pad from Head until Pad is disengaged from Head, and then read the scale.
D. The proper pressure is between 20 grams and 30 grams.
E. If pressure is not within the above range. Adjust Pad Spring.

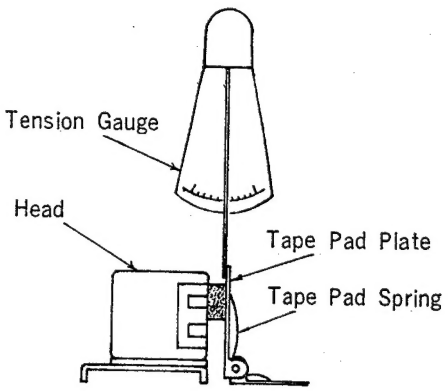


Figure 13

4. TAPE SPEED ADJUSTMENT

(Refer to Figure 8)

A. Measure Tape Speed for 1 minute by using Tape-Speed Measuring Tape (3M SCOTCH Tape NO. 24) and Stop Watch.
B. If Tape Speed is not within the range of ±3%, make adjustment of Tape Speed in the following manner.
   a. Check a take up Torque in Forward Play mode.
   b. Check a Pinch Roller Presser.
   c. Check an oil stain of Capstan, Pinch Roller, Idler Wheel and Fly Wheel.
   d. Replacement of Motor Pulley (32).

5. SHUT-OFF SWITCH ADJUSTMENT

(Refer to Figure 14)

Loosen the two SCREWS [201(A), (B)]
Set the recorder in FORWARD PLAY mode and position the SHUT-OFF SWITCH (S7) rotating it around the SCREW 201 (A), checking to see that power is supplied to the recorder while tape is running and switched off while tape is out.
Fasten the SCREWS (201) after proper timing is attained.

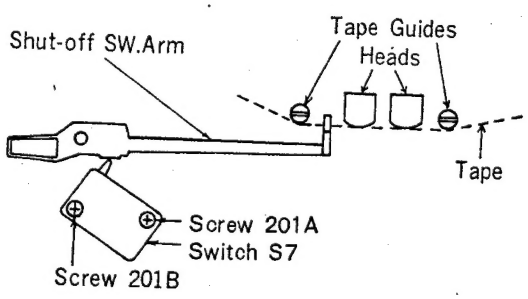


Figure 14

6. RECORD/PLAYBACK HEAD (82) ADJUSTMENT (Refer to Figure 15)

1. With the recorder in operating condition, thread standard azimuth alignment tape on recorder and operate in PLAYBACK mode.
2. ADJUST the SCREW (25) of the RECORD/PLAYBACK HEAD (82) to obtain maximum output and best reproduction of high frequencies using the azimuth alignment tape.

7. HEADS (81) (82) HEIGHT ADJUSTMENT (Refer to Figure 5 and Figure 15)

1. Remove the HEAD ASSEMBLY removing the SCREW (78).
2. Loosen the CLUMP NUTS (84) on the back of the HEAD MOUNT (83) so that the TAPE GUIDES (75) can be adjusted.
3. Reassemble the HEAD ASSEMBLY fixing the SCREW (78).
4. Thread a quater-tack test tape.
5. Operate the recorder in the FORWARD PLAY mode with the VOLUME CONTROLS set on maximum, and adjust the TAPE GUIDE (right) (75) for maximum output from the tape.
6. Next, operate the recorder in the RECORD mode with the VOLUME CONTROLS set on minimum and signal source disconnected from the recorder using other tape and erase the tape.
7. If the tape is not completely erased, adjust the TAPE GUIDE (75) (left).
8. After complete alignmen is attained, tighten the CLUMP NUTS (84) removing the HEAD ASSEMBLY and then fix it on the original position.

8. TAPE PADS POSITIONING ADJUSTMENT (Refer to Figure 15)

While using a standard test tape and operating the recorder in PLAYBACK mode, loosen the TAPE PAD ASSEMBLY RETAINING SCREWS (100) and position the BRACKET (106) (R/P Head) to obtain maximum output.
While using an other recorded tape and operating the recorder in RECORD mode with volume control in minimum and position the BRACKET (106) (Erase Head) to obtain complete erase.
When proper positioning is obtained, tighten down the retaining screw (100).

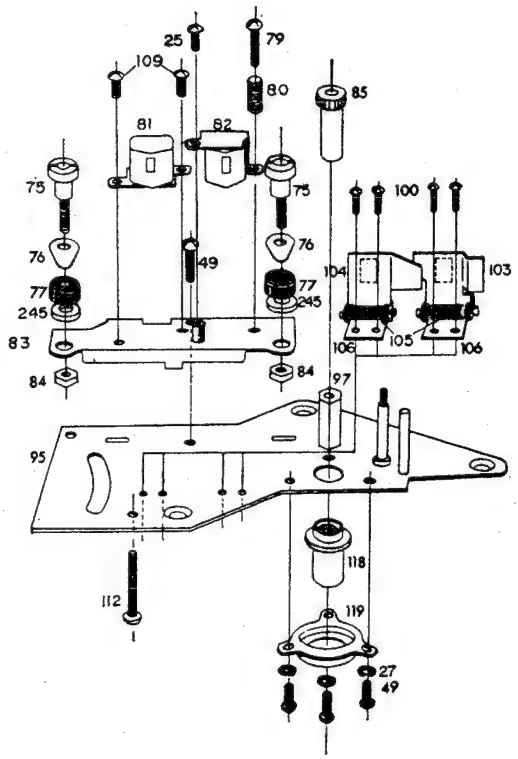


Figure 15

ELECTRICAL MEASUREMENTS

1. PLAYBACK AMPLIFIER SENSITIVITY (Refer to Schematic Diagram and Figure 16)

1. Set the recorder in STEREO PLAYBACK mode.
2. Set a 8 ohm dummy resistor (2W, 5%) across the LINE OUT jacks (J5 and J6) of the both channels.
3. Connect the Sine Wave Generator for 1000 Hz −52dB (=2.5mV), OdB=1V across the CH-1 and CH-2 terminals of the RECORD/PLAYBACK HEAD (82).
4. Connect an AC VTVM across the 8 ohm dummy resistor of the LINE OUT jacks (J5, J6). If the playback amplifier sensitivity is normal, the reading on the VTVM should be approximately 0.5V.

Instruments Required:
- Signal Generator
- (or A.F. Oscillator)
- AC (VTVM)
- 2.7K ohm 1/4W, 5%, Resistor
- 27 ohm 1/4W, 5%, Resistor
- 8 ohm 2W, 5%, Resistor

Measuring Circuit:
- Refer to Figure 16

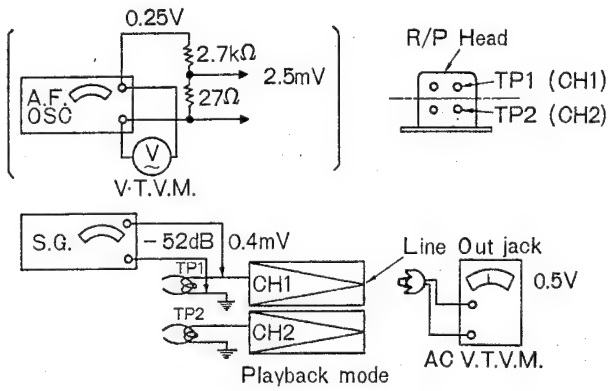


Figure 16

2. RECORD AMPLIFIER SENSITIVITY (Refer to Figure 17 and Schematic Diagram)

1. Set the recorder in STEREO RECORDING mode with the VOLUME CONTROLS in maximum.
2. Put some insulator (paper, etc.) between the contacting leaves of the RECORD SAFETY LEVER SWITCH (S6) to stop the BIAS OSCILLATION.
3. Unsolder the ground wire connection at the RECORD/PLAYBACK HEAD (82) (on the schematic diagram, this connection is designated as TP1, TP2) and insert a 100 ohm resistor (1/2W, 5%) between the open connection on the tape head and the open end of the wire that was removed.
4. Connect the Sine Wave Generator for 1000 Hz −80dB (0.1mV), Odb=1V across the MICROPHONE jacks (J1 and J2).
5. Connect an AC VTVM across the 100 ohm resistor. If the record amplifier sensitivity is normal, the reading of the VTVM should be approximately 3.5mV.
6. In this condition, the needle of the LEVEL METERS (M1 and M2) should point the proper position on the scale. (Between the white and red area)

Insuruments Required:
- Signal Generator
- (or A.F. Oscillator)
- AC VTVM
- 2.7K ohm, 1/4W, 5%, Resistor
- 27 ohm, 1/4W, 5%, Resistor
- 100 ohm, 1/2W, 5%, Resistor

Measuring Circuit:
- Refer to Figure 17 and Figure 18

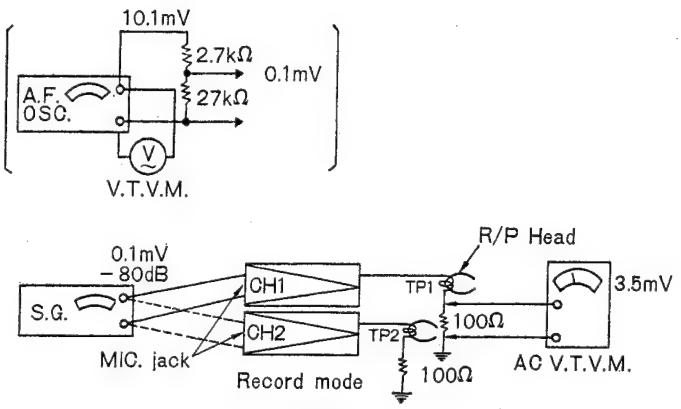


Figure 17

3. RECORD BIAS VOLTAGE (Refer to Figure 18 and Figure 19)

1. Set the recorder in STEREO RECORDING mode with the VOLUME CONTROLS in minimum.
2. Insert a 100 ohm resistor (1/2W, 5%) in the ground lead of the RECORD/PLAYBACK HEAD (82).
3. Connect an AC VTVM across the 100 ohm resistor.
4. Adjust the VARIABLE RESISTOR (8V-723) so that the reading on the VTVM should be approximately 50mV.

Instruments Required:
AC VTVM
100 ohm, 1/2W, 5%, Resistor
Methode:
Refer to Fig. 18 and Fig. 19

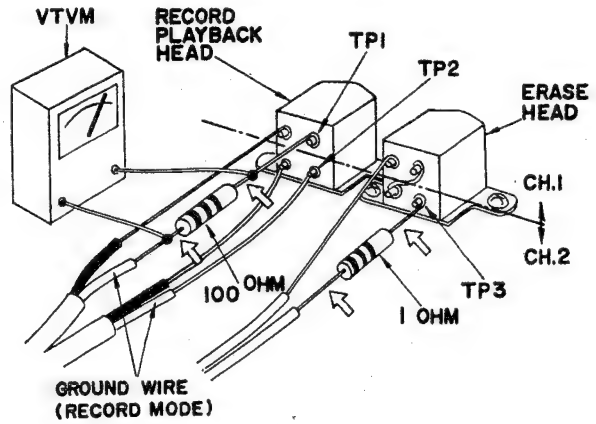


Figure 18

4. RECORD BIAS FREQUENCY

(Refer to Figure 19)

1. As shown in Fig. 19 insert a 100Ω Resistor to ground Lead Wire of Record/Playback Head. Connect vertical Axis of Oscilloscope across Resistor. Connect horizontal Axis of Oscilloscope to Output Terminal of Signal Generator.
2. When the recorder is set to "RECORD" mode, connected as above, Lissajou's Figure 19 will appear on the Oscilloscope. Refer to this Figure 19 to check frequency of Bias Oscillator. The standard Frequency is approximately 75~85KHz.

Instrument Required:
Oscilloscope Signal Generator
100 ohm, 1/2W, 5%, Resistor
Measuring Circuit.
Refer to Fig. 18 and Fig. 19

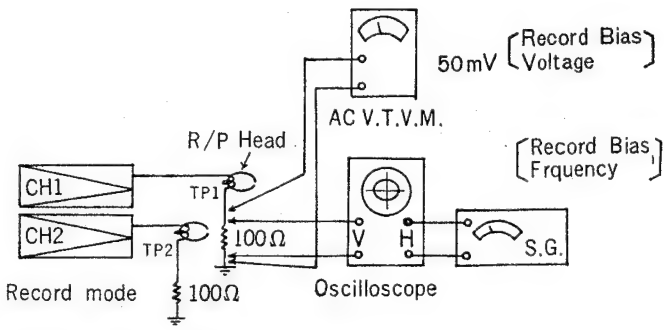


Figure 19

5. ERASE VOLTAGE (Refer to Figure 18 and 20)

1. Set the recorder in STEREO RECORDING mode.
2. Unsolder the ground wire connection at the ERASE HEAD (81) (CH2) (On the schematic diagram, it is shown as TP3 and insert a 1 ohm resistor (1 W, 5%).
3. Connect an AC VTVM across the 1 ohm resisor.
   If the set is normal, the reading on the VTVM should be approximately 35mV.

Instrument Required:
AC VTVM
1Ω, 1W, 5%, Resistor
Measuring Circuit:
Refer to Fig. 18 and Fig. 20

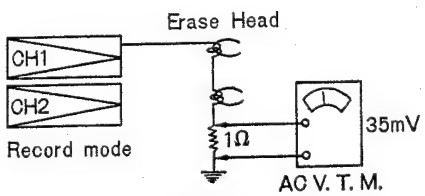


Figure 20

6. POWER SOURCE VOLTAGE CHANGING (Refer to Figure 4)

1. Remove the Power Source Voltage Changing Lid (172) on the Cabinet Bottom.
2. Set the power voltage changing tip on the proper terminal according to any convenient outlet.

7. POWER SOURCE CYCLES CHANGING

1. Replace the MOTOR PULLEY (32) (Refer to Figure 8).

   For 60 Hz : Index No. 0, 1, 2, 3, 4

   For 50 Hz : Index No. 5, 6, 7, 8, 9

   Example : . 60 Hz No. 2 corresponds to 50 Hz No. 7
   50 Hz No. 9 corresponds to 60 Hz No. 4

2. Change the lead wire connection of the MOTOR (178). (Refer to Schematic Diagram)

   For 60 Hz, the lead of the MOTOR (178) should be connected to 120 V tap of the POWER TRANSFORMER (T6).

   For 50 Hz, the lead of the MOTOR (178) should be connected to 110 V tap of the POWER TRANSFORMER (T6).

MAINTENANCE

CLEANING

The pinch roller, capstan, tape guides, record/playback head, erase head may accumulate tape oxide coating worn off the tape as it passes these parts. This accumulation will cause poor performance and should be removed with a soft lint-free cloth moistened with commercial head cleaner or alcohol.

LUBRICATION

Sliding bearing surface should be cleaned with a clean soft cloth and light grease applied. Rotating bearing such as pulley and motor bearings shoud be oiled sparingly with light non-detergent oil. Avoid excess lubrication.
Any excess oil or grease on pulleys, belts or capstan should be removed with a cloth moistened with alcohol.

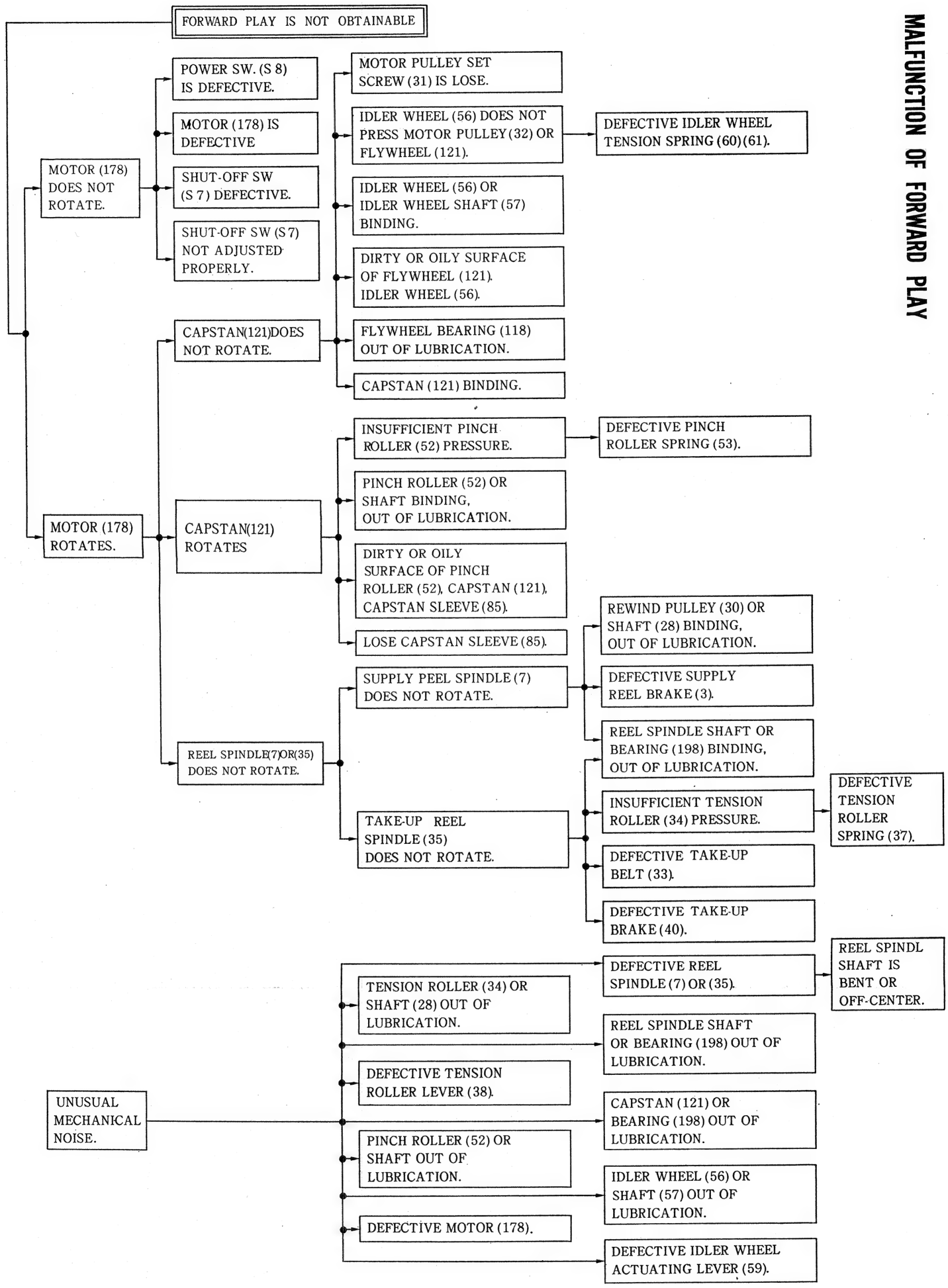
DEMAGNETIZING THE HEADS

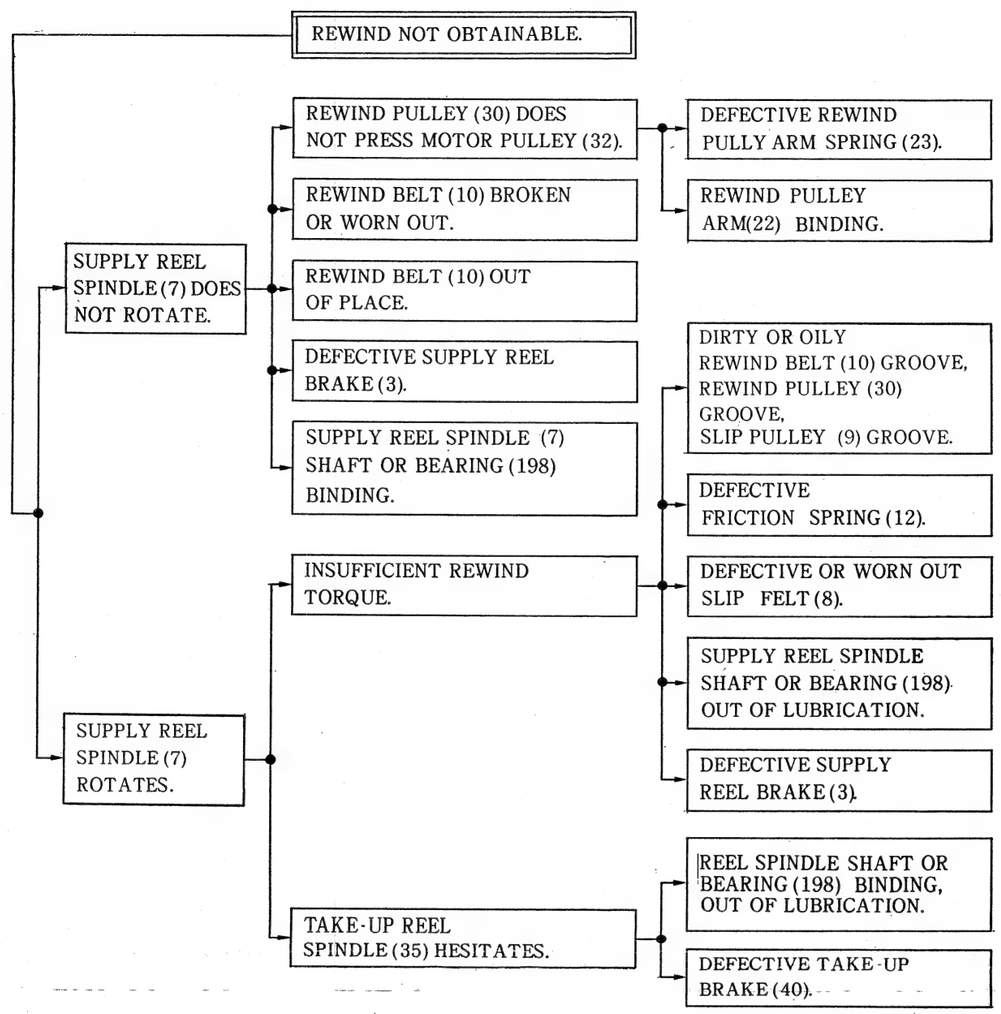
The heads may become magnetized by using an ohm-meter on them or their associated circuitry, or by a strong magnetic field near them such as a solder gun of speaker. Magnetized head will cause hiss or even partial erasure of tapes.

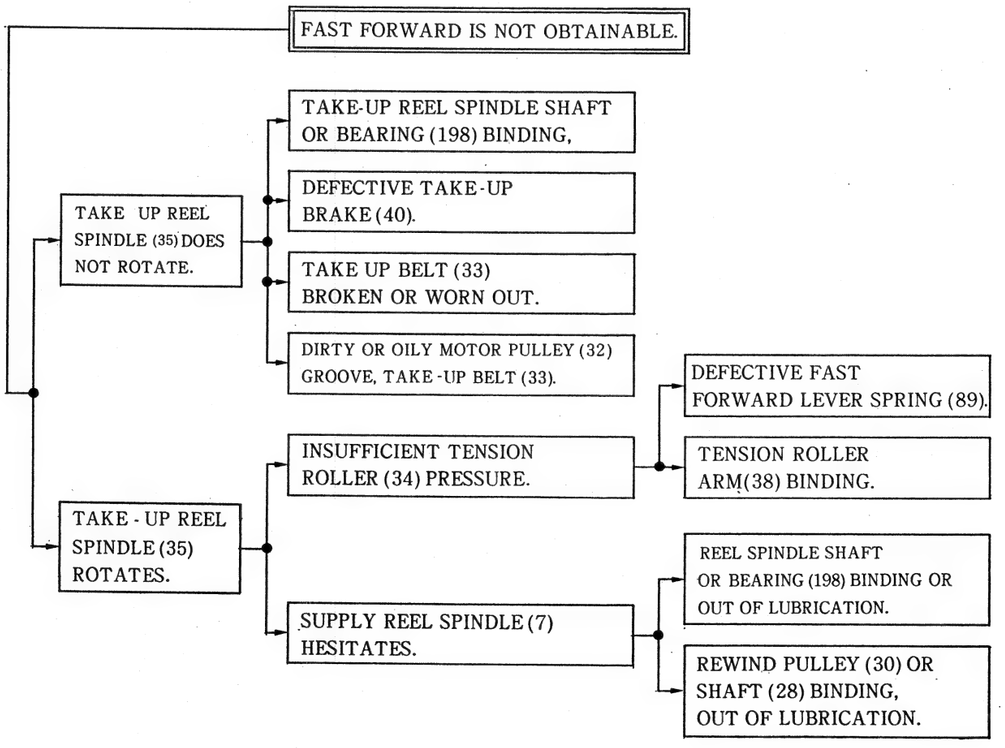
If heads should become magnetized, they can be demagnetized by use of a head demagnetizer. Move the demagnetizer slowly around both heads (Be careful not to scratch the brass surface that contacts the tape), and all parts in the tape path. Be sure to turn the magnetizer off only when it is away from the heads, as it may actually magnetize the heads. Also, keep the demagnetizer away from the recording tape.

TROUBLE CHART

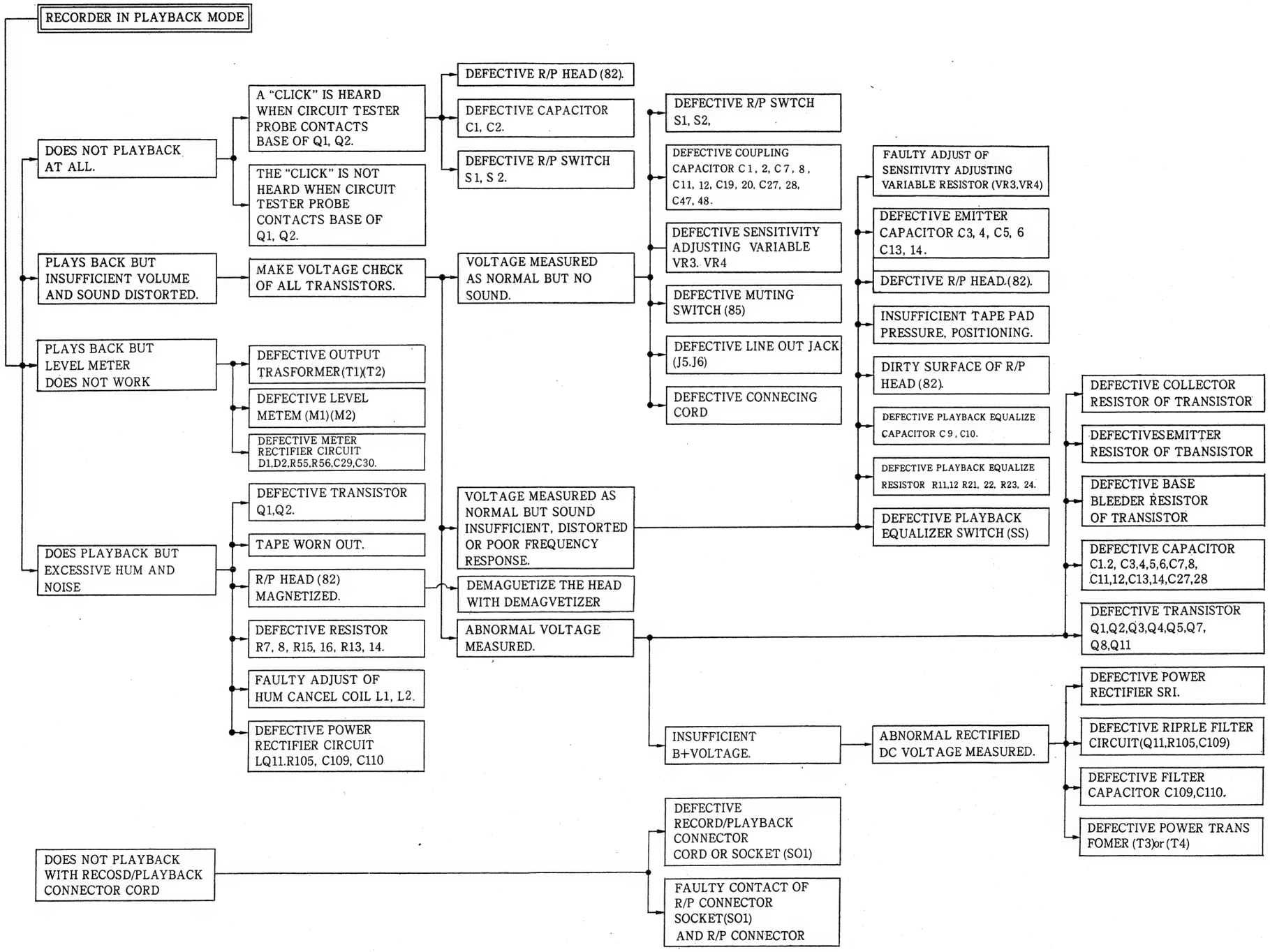
MALFUNCTION OF FORWARD PLAY



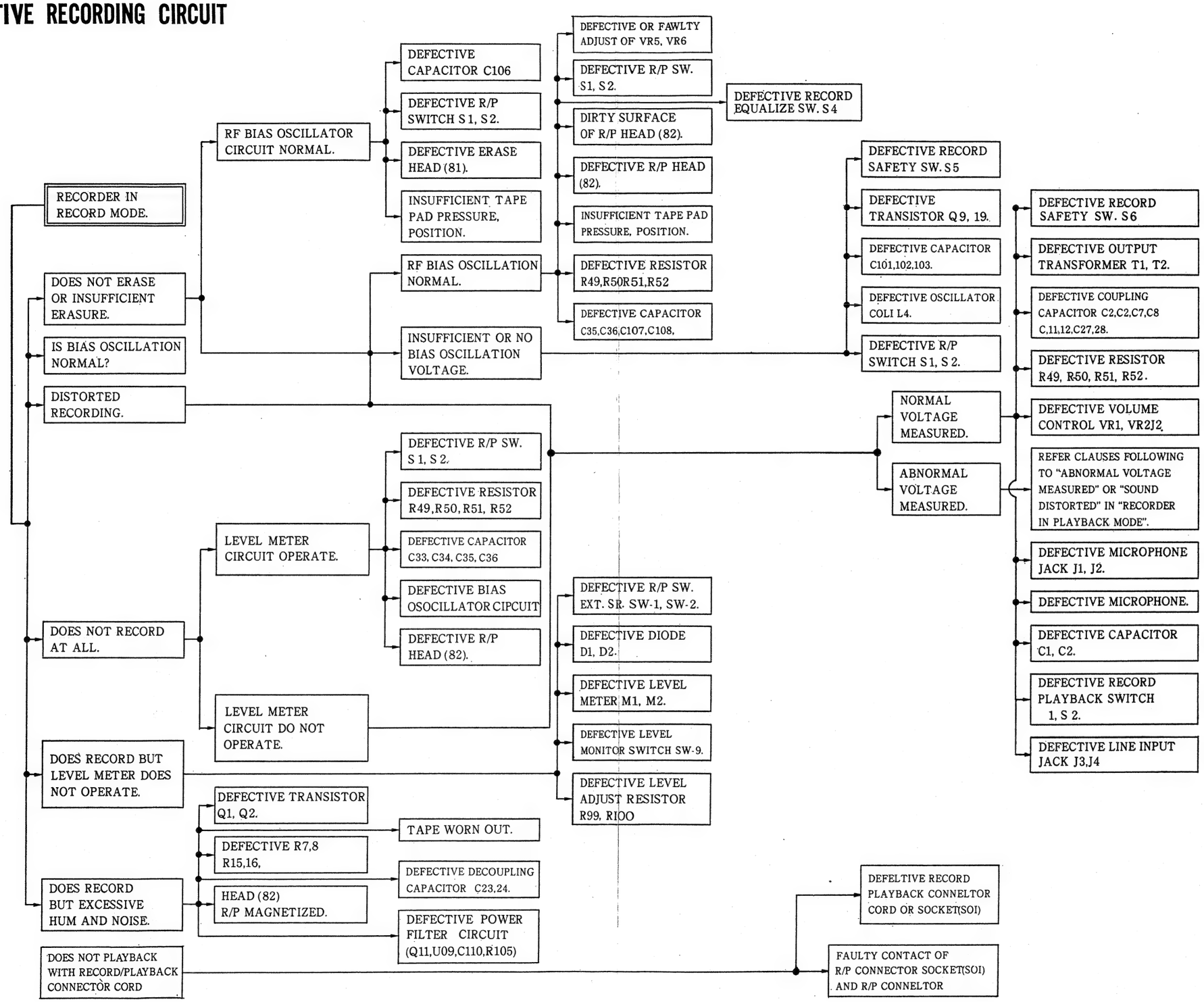

REWIND NOT OBTAINABLE.
SUPPLY REEL SPINDLE (7) DOES NOT ROTATE.
REWIND PULLEY (30) DOES NOT PRESS MOTOR PULLEY (32).
DEFECTIVE REWIND PULLY ARM SPRING (23).
REWIND PULLEY ARM(22) BINDING.
REWIND BELT (10) BROKEN OR WORN OUT.
REWIND BELT (10) OUT OF PLACE.
DEFECTIVE SUPPLY REEL BRAKE (3).
SUPPLY REEL SPINDLE (7) SHAFT OR BEARING (198) BINDING.
SUPPLY REEL SPINDLE (7) ROTATES.
INSUFFICIENT REWIND TORQUE.
DIRTY OR OILY REWIND BELT (10) GROOVE, REWIND PULLEY (30) GROOVE, SLIP PULLEY (9) GROOVE.
DEFECTIVE FRICTION SPRING (12).
DEFECTIVE OR WORN OUT SLIP FELT (8).
SUPPLY REEL SPINDLE SHAFT OR BEARING (198) OUT OF LUBRICATION.
DEFECTIVE SUPPLY REEL BRAKE (3).
TAKE-UP REEL SPINDLE (35) HESITATES.
REEL SPINDLE SHAFT OR BEARING (198) BINDING, OUT OF LUBRICATION.
DEFECTIVE TAKE-UP BRAKE (40).

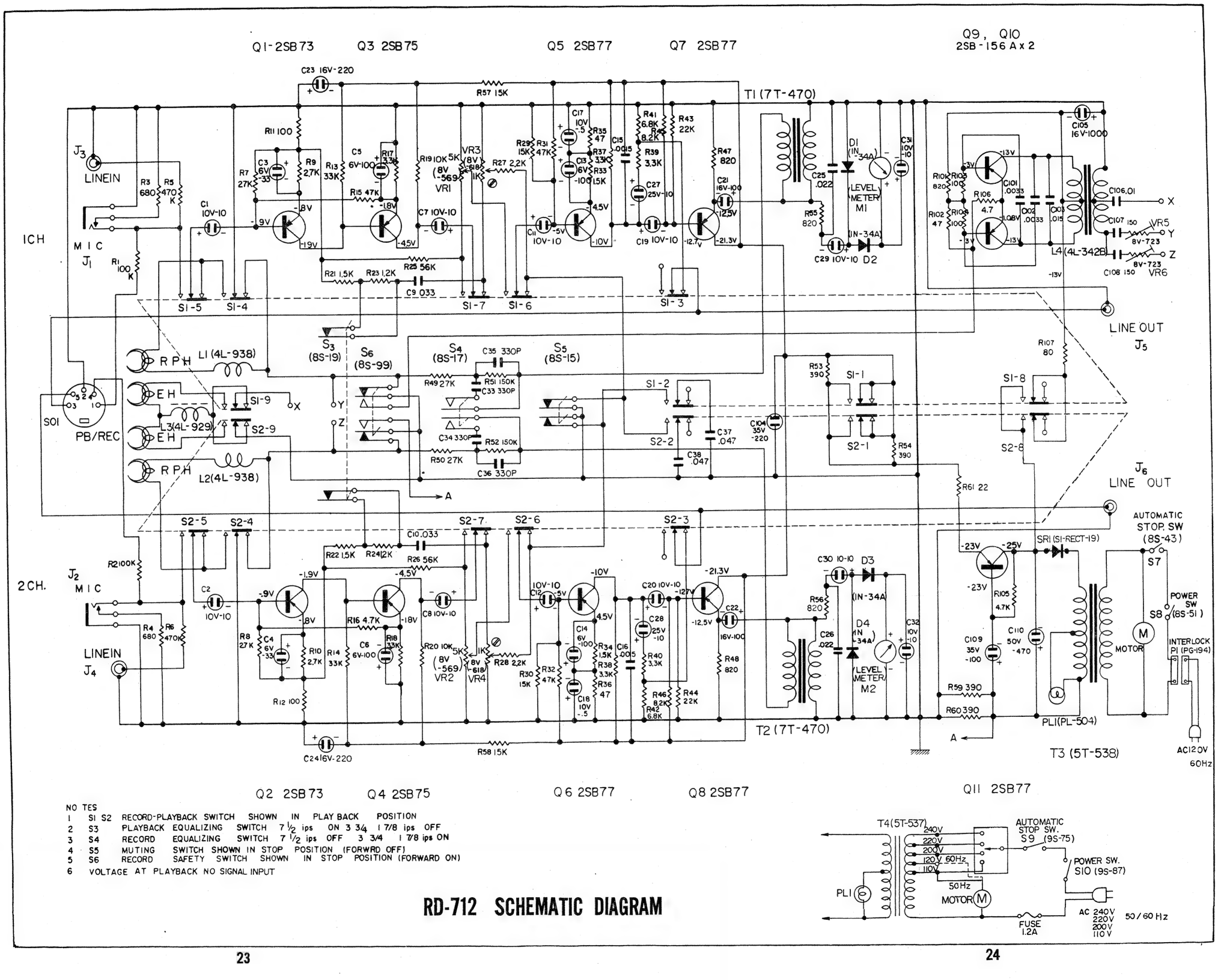

FAST FORWARD IS NOT OBTAINABLE.
TAKE UP REEL SPINDLE (35) DOES NOT ROTATE.
TAKE-UP REEL SPINDLE SHAFT OR BEARING (198) BINDING,
DEFECTIVE TAKE-UP BRAKE (40).
TAKE UP BELT (33) BROKEN OR WORN OUT.
DIRTY OR OILY MOTOR PULLEY (32) GROOVE, TAKE-UP BELT (33).
TAKE - UP REEL SPINDLE (35) ROTATES.
INSUFFICIENT TENSION ROLLER (34) PRESSURE.
DEFECTIVE FAST FORWARD LEVER SPRING (89).
TENSION ROLLER ARM(38) BINDING.
SUPPLY REEL SPINDLE (7) HESITATES.
REEL SPINDLE SHAFT OR BEARING (198) BINDING OR OUT OF LUBRICATION.
REWIND PULLEY (30) OR SHAFT (28) BINDING, OUT OF LUBRICATION.

DEFECTIVE PLAYBACK CIRCUIT



DEFECTIVE RECORDING CIRCUIT

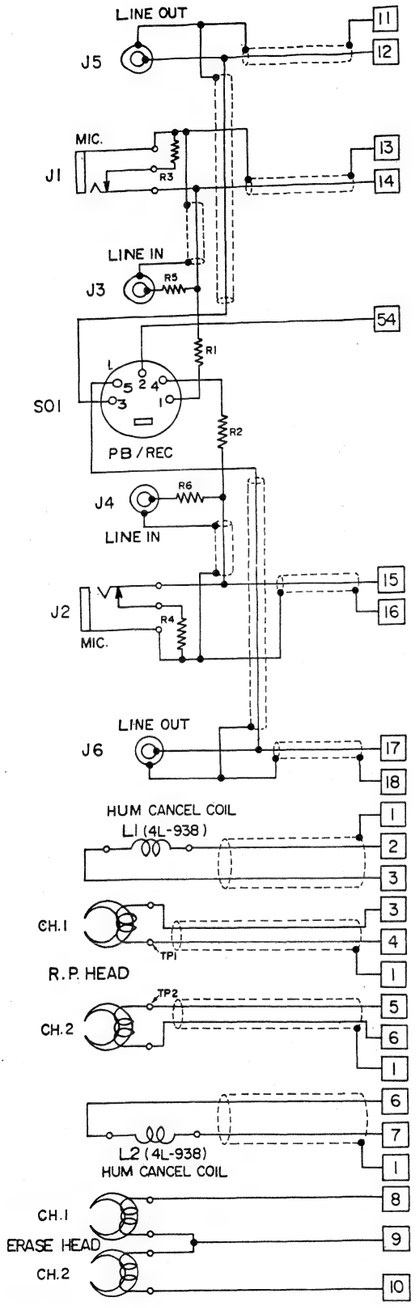


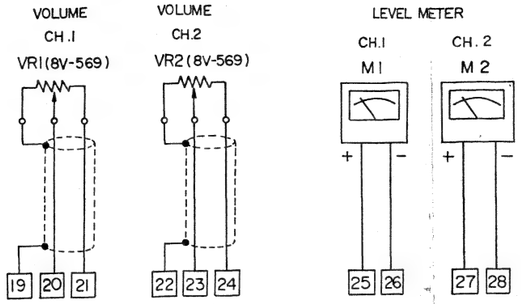


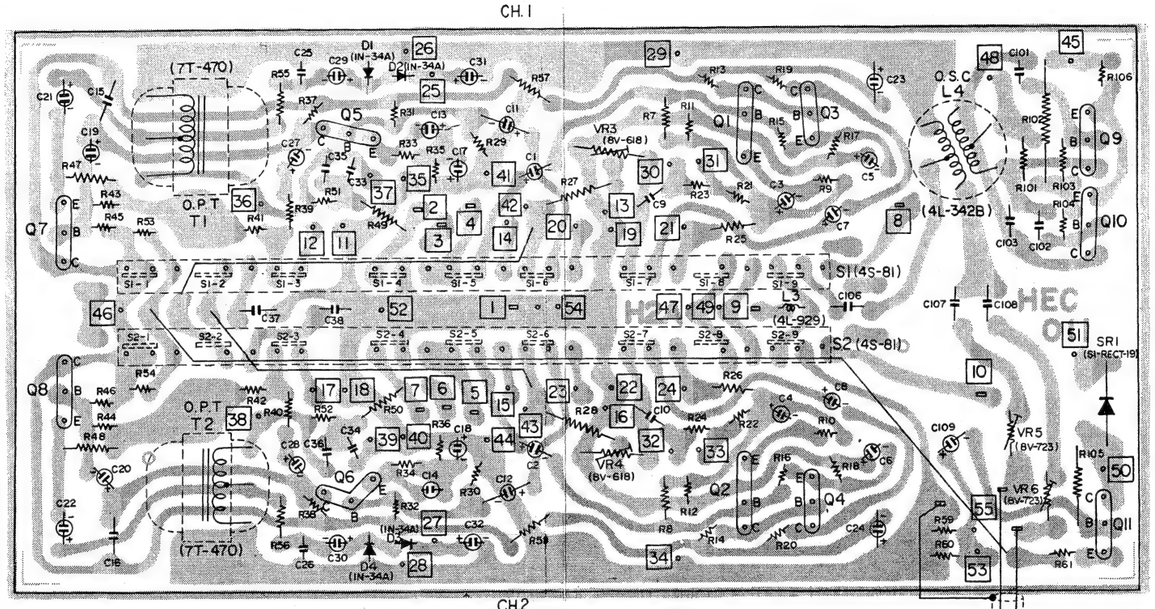
NO TES

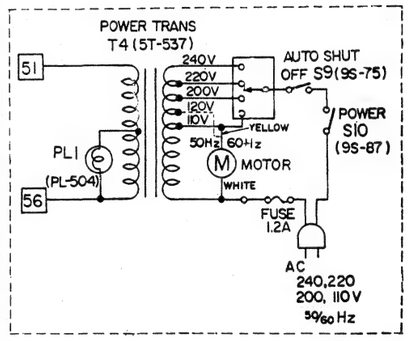
1 S1 S2 RECORD-PLAYBACK SWITCH SHOWN IN PLAY BACK POSITION
2 S3 PLAYBACK EQUALIZING SWITCH 7 1/2 ips ON 3 3/4 1 7/8 ips OFF
3 S4 RECORD EQUALIZING SWITCH 7 1/2 ips OFF 3 3/4 1 7/8 ips ON
4 S5 MUTING SWITCH SHOWN IN STOP POSITION (FORWRD OFF)
5 S6 RECORD SAFETY SWITCH SHOWN IN STOP POSITION (FORWARD ON)
6 VOLTAGE AT PLAYBACK NO SIGNAL INPUT

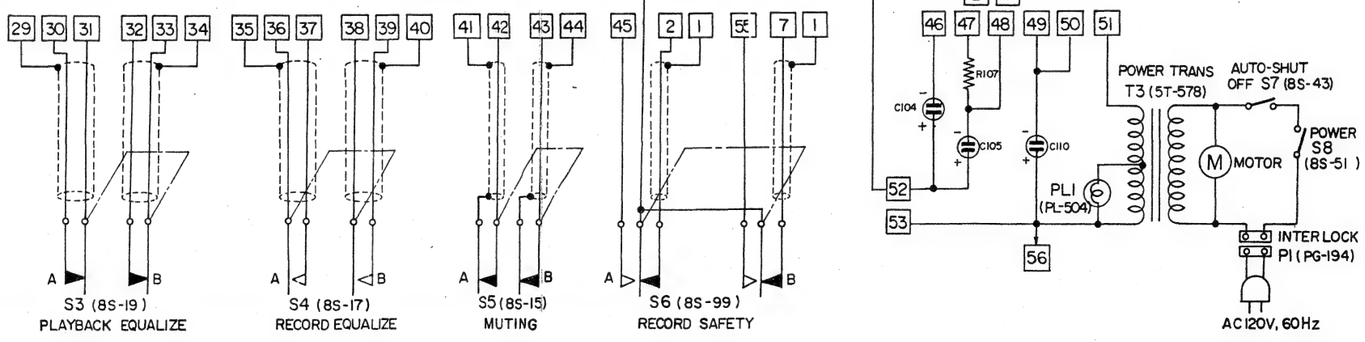
RD-712 SCHEMATIC DIAGRAM



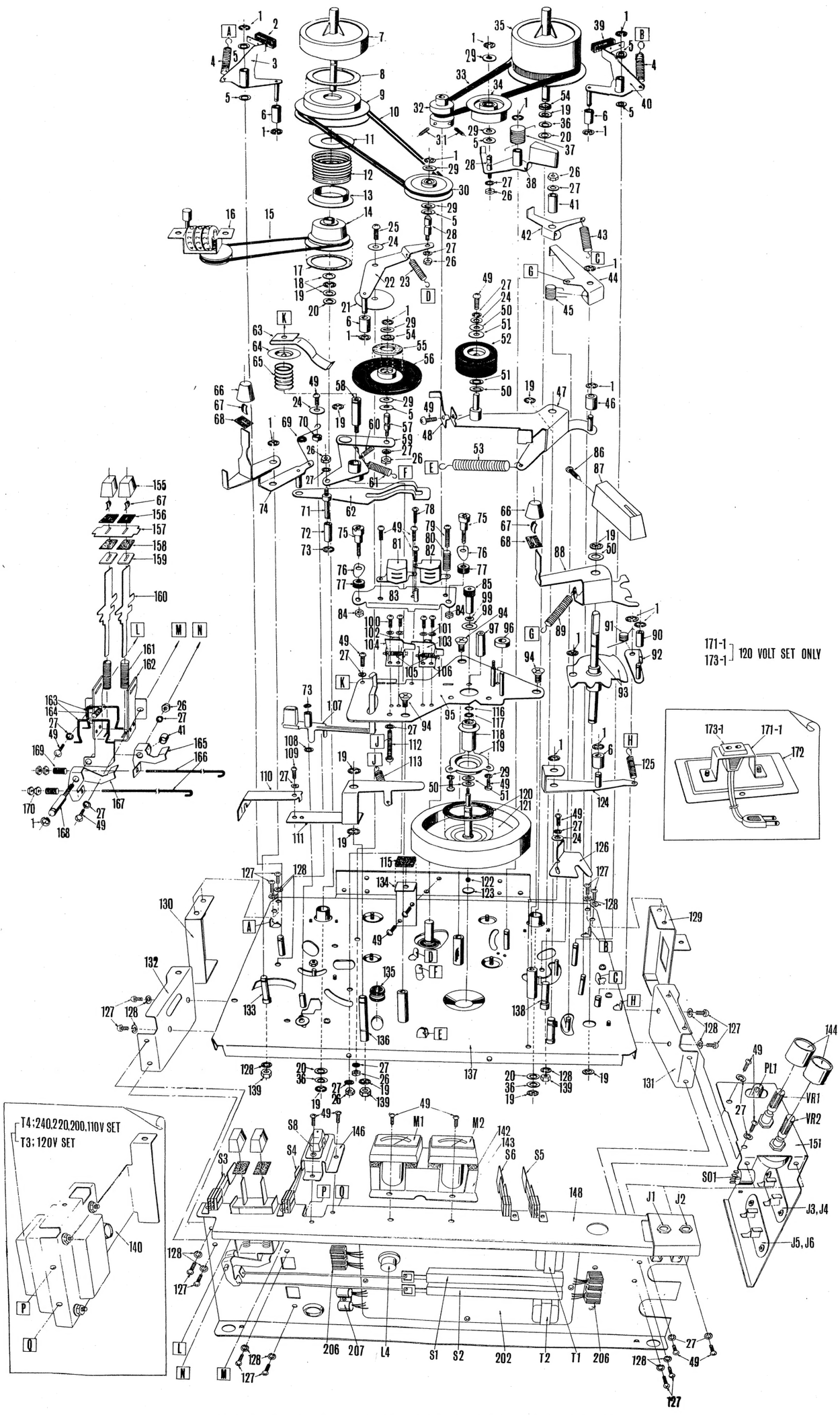




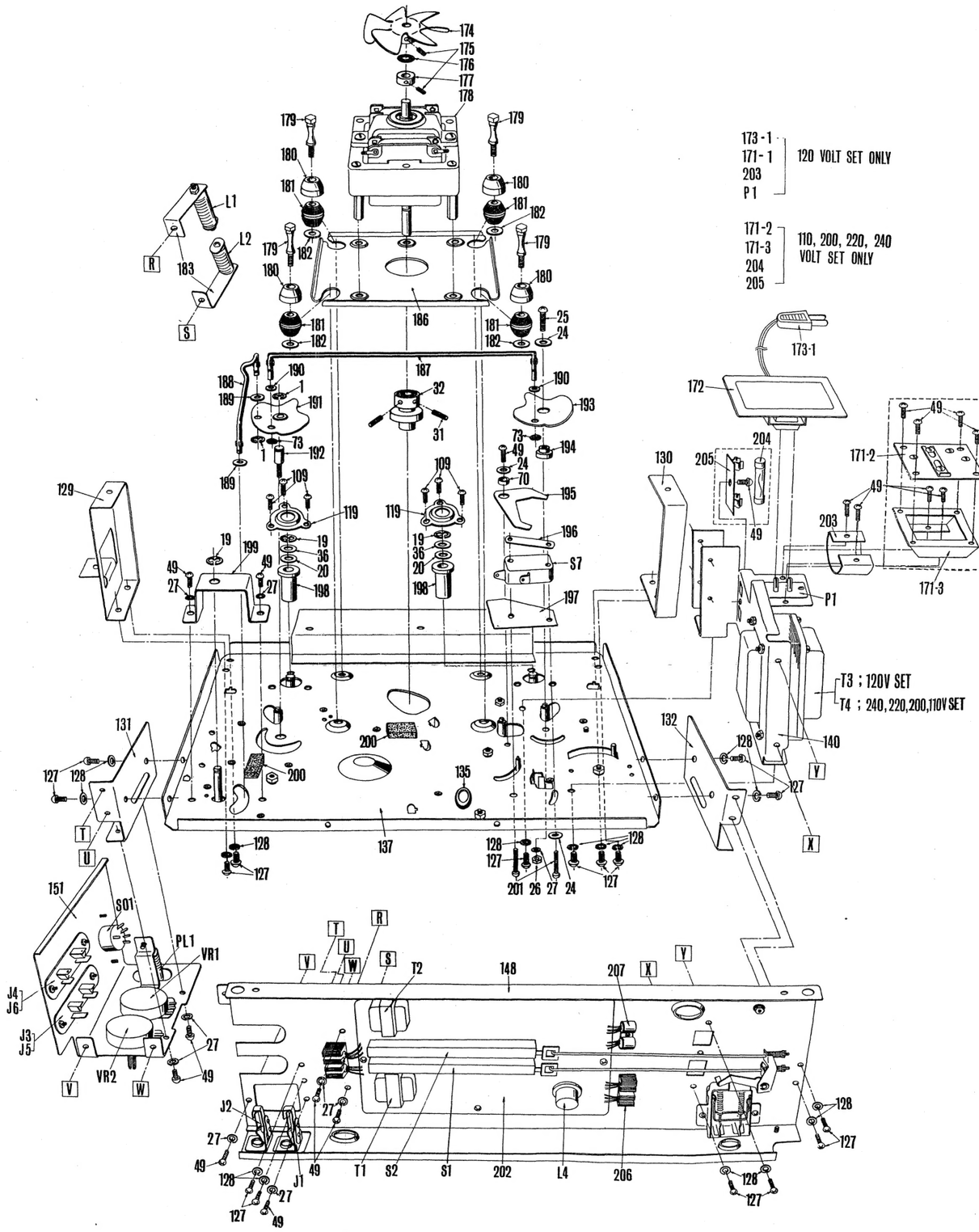




RD-712 PRINTE CIRCUIT BOARD (BOTTOM VIEW)



BD-712 MECHANISM EXPLODED TOP VIEW



RD-712 MECHANISM EXPLODED BOTTOM VIEW

PARTS LIST

MECHANISM

REF. NO.	PART NO.	DESCRIDTION
1	E-3	"E" Washer, 3ϕ
2	FELT-197	Brake Shoe, Supply Brake (Part of 3)
3	LEVER-271A	Arm Supply Brake
4	SPR-271D	Siprng (Left Brake to Chassis)
5	5.2W10-0.2	Washer, Fiber
6	ROLL-271A	Roller, Brake Arm
7	REEL-DAI-A	Reel Spindle, Supply
8	FELT-201	Felt Ring (Part of 9)
9	SLIP-WHEEL for #2461	Slip Pulley, Supply
10	BELT-271A	Belt, Rewind, Rubber
11	20W44.8-0.5	Spacer, Nylon
12	SPR-271N	Spring (Supply Spindle Shaft)
13	SPR-COVER	Spacer, Nylon
14	PULLY-271B	Counter Pulley, Supply
15	BELT for 1883	Belt, Counter, Rubber
16	COUNTER	Tape Counter
17		Felt Ring (Part of 14)
18	5.7W10-0.5	Washer, Fiber
19	E-4	"E" Washer, 4ϕ
20	5.7W10-0.2	Washer, Nylon
21	3.1W36-0.5	Washer, Fiber
22	LEVER-271C	Arm, Rewind
23	SPR-271U	Spring (Rewind Arm to Chassis)
24	3.2W10-0.5	Washer, Metal
25	3M+10S	Screw, 3ϕ×10 mm
26	3N	Nut, 3ϕ
27	3SW	Lock washer, 3ϕ
28	SHAFT271D	Shaft, Rewind Arm, Tension Roller Arm
29	5.1W10-0.2	Washer, Nylon
30	PULLY-271A	Pulley, Rewind
31		Set screw, Motor Pulley (Part of 32)
32		Motor Pulley (Part of 178)
33	BELT-271C	Bellt, Take-up
34	T-ROLL	Tension Roller
35	REEL-DAI-B	Reel Spindle, Take-up
36	5.7W10-1.2	Washer, Fiber
37	SPR-271G or SPR-271V	Spring, Tension Roller Arm
38	LEVER-271D	Arm, Tension Roller
39	FELT-247	Brake Shoe, Take-up Brake, Part of 40
40	LEVER-271B	Arm, Take-up Brake
41	SLEEVE-B	Sleeve, Tension Roller Stopper Arm
		R/P Switch Actuating Arm
42	LEVER-271L	Arm, Tension Roller Stopper
43	SPR-271B	Spring, Tension Roller Stopper Arm
44	LEVER-271K	Lever, Tension Roller Actuating
45	SPR-271S	Spring, Tension Roller Actuaning Lever
46	ROLL-271B	Roller, Pinch Roller Arm
47	LEVER-271I	Arm, Pinch Roller
48	LEVER-271J	Lever, Tape Pad Actuating
49	3M+6S	screw, 3ϕ×6 mm
50	6.2W13.5-0.2	Washer, Fiber
51	6.2W13.5-0.2	Washer, Nylon
52	PINCH-ROLL for #2271	Pinch Roller
53	SPR-271M	Spring, Pinch Roller Arm
54	FELT-193	Felt Ring, Idler Oil Cutting
55	FELT-189	Felt Ring, Idler Oil Cutting

REF. NO.	PART NO.	DESCRIPTION
56	IDLER-271A	Idler Wheel
57	SHAFT-271E	Shaft, Idler Wheel
58	SHAFT-271F	Shaft, Idler Wheel Arm
59	LEVER-271G	Arm, Idler Weel
60	SPR-271H	Spring, Idler Wheel Arm
61	SPR-271I	Spring, Idler Wheel Arm
62	LEVER-271E	Lever, Idler Wheel Arm Actuating
63	SPR-271T	Spring ,Plate, Pressing 62
64	SPR-COVER for #2271	Spring Cap
65	SPR-271J	Spring, Idler Wheel Arm Actuating
66	8K-194	Button, Speed Selector
67	SPR-251B	Spring, Button
68	FELT-203	Felt, Speed Select & Fast Forward Lever
69	SPR-271K	Spring, Toggle
70	SPACER-271C	Sleeve, Metal
71	SHAFT-271H	Shaft, Idler Wheel Arm
72	ROLL-271D	Roller, Idler Wheel Arm
73	E-2	"E" Washer, 2ϕ
74	LEVER-271F	Lever, Speed Selector
75	TAPE-GUID for #2271	Guide, Tape
76	TAPE-SIJI	Lug, Tape Guide
77	GOMU-SPACER	Spacer, Rubber, Tape Guide
78	3M+8S	Screw, 3ϕ×8 mm
79	3M+12S	Screw, 3ϕ×12 mm
80	SPR-271Q	Spring, Head Adjusting
81	HEAD-271B	Head, Erase, 900 ohm IMP at 85KHz
82	HEAD-271A	Head, Record-Playback 2K ohm at 1000Hz 95K ohm at 85KHz
83	HEAD-DAI for #2271	Plate, Head Mounting
84	4TOK-N	Nut, 4ϕ Tape Guide
85	CAP-SLEEVE for #2271	Sleeve, Capstan
86	4TOK-105	Screw, Function Knob Retaining
87	8K-192	Knob, Function Selector
88	CAM-PLATE-D	Lever, Fast Forward
89	SPR-271P	Spring, Fast Forward Lever
90	ROLL-271C	Roller, Fast Forward Lever Lock
91	SPR-271C	Spring, Fast Forward Lock Lever
92	LOCK-PLATE-B	Cam, Fast Forward Lever Detent
93	CAM-PLATE-A	Shaft & Cam, Function Selector
94	4S+6S	Screw, 4ϕ, Head Chassis Retaining
95	6SC-271	Head Chassis Assembly
96	6.2W13.5-3.2	Washer, Fiber
97	H-COV-STAY	Stud, Head Cover Supporting
98	5.2W10-1	Washer, Silicon Rubber
99	3W6-0.5	Washer, Nylon
100	2.6M+3S	Screw, 2.6ϕ×3 mm
101	2.6SW	Lock Washer, 26ϕ
102	FELT-195	Felt, Tape Pad (Part of 103, 104)
103	PAT-P-A	Tape Pad Plate, R/P Head, Tape Pad Ass'y
104	PAT-P-B	Tape Pad Plase, Eras Head, Tape Pad Ass'y
105	SPR-271R	Spring, Tape Pad Ass'y
106	PAT-P-DAI	Tape Pad Bracket, Tape Pad Ass'y
107	CUT-SW-ARM	Arm, Auto-Shut Off
108	3.2W7.9-0.3	Washer, Nylon

REF. NO.	PART NO.	DESCRIPTION
109	3M+4S	Screw, 3ϕ×4 mm
110	B-PLATE	Lever, Record Lock
111	LEVER-271M	Arm, Record Lock
112	3M+30S	Screw, 3ϕ×30 mm
113	SPR-271L	Spring, Record Lock Arm
115	FELT-225	Felt (Part of 134)
116	OIL-SPRING	Spring, Capstan Bearing, (Part of 118)
117	MOLT-P-305	Polyurethane, (Part of 118)
118	METAL-271A	Bearing, Capstan
119	METAL-OSAE	Retainer, Bearing
120	FELT-191	Felt Flywheel (Part of 121)
121	FLY-WHEEL for #2271	Flywheel Ass'y
122	BALL for #2271	Ball, Bearing 2.5ϕ
123	PACKIN	Bearing Plate, Fiber, (Part of 137)
124	LOCK-PLATE-A	Lever, Function Detent Cam
125	SPR-271F	Spring, Function Detent Cam Lever
126	STOPER for #2271	Stopper, Pinch Roller Lever
127	4M+6S	Srew, 4ϕ×6 mm
128	4SW	Lock Washer, 4ϕ
129	CAB-ANG-565D	Bracket, Chassis & Cabinet Retaining
130	CAB-ANG-565C	Bracket, Chassis & Cabinet Retaining
131	CAB-ANG-565B	Bracket, Chassis & Amp. Chassis Ass'y Retaining
132	CAB-ANG-565A	Bracket, Chassis & Amp. Chassis Ass'y Retaining
133	LEVER-SHAFT B	Shaft, Speed Select Lever
134		Bracket, Reel Panel Supporting, (Part of 137)
135	ZETUEN-BUSH	Bushing Rubber
136	LEV-SHAFT A	Shaft, Record Lock Arm
137	6MC-271A	Chassis Ass'y
138	SHAFT-271A	Shaft, Pinch Roller Arm
139	4N	Nut, 4ϕ
140	PT-ANG-271	Bracket, Power Transformer Retaining
142	MOLT-P-303	Meter Cushion, Polyurethane
143	M-ANG-271	Bracket, Meters Mounting
144	8K-240	Knob, Volume, Tone Controls
146	SW-ANG-565	Bracket, Switch Mounting
148	6AMP-C565	Amp. Chassis Ass'y
151	J-ANG-565A	Bracket, Volume Jack Mounting
155	8K-195	Button, Record
156	FELT-223	Felt, Record Button
157	B-ANG-271B	Plate, Record Button
158	FELT-199	Felt, Record Button
159	B-STOPPER	Plate, Record Button Lever
160	LEVER-271N	Lever Record Button
161	B-SPRING	Spring, Record Button Lever
162	B-ANG-271A	Bracket, Record Ass'y
163	ROD-271C	Rod, Record Lock
164	SPR-825-B	Spring, Record Lock Rod
165	LEVER-271P	Arm, R/P Switch Actuating
166	ROD-271D	Rod, R/P Switch Actuating
167	LEVER-271Q	Arm, R/P Switch Actuating
168	SHAFT-271I	Shaft, R/P Switch Actuating Arm
169	SWITCH-SPR	Spring, R/P Switch Actuating Rod
170	2N	Nut, 2ϕ

REF. NO.	PART NAME	DESCRIPTION
171-1	LOCK-ANGLE 120 Volt set only	Bracket, Interlock
171-2	T-919 110, 200, 220 240V set only	Voltage Changing Plate Bakelite
171-3	HAIDEN-P-A,110,200, 220, 240V set only	Bracket, Voltage Changing Plate Retaining
172	LOCK-BAN	Lid, Power Source Changing
173-1	ACC-245, 120V set only	Power Cord
174	Part of 178	Fun, Motor (Part of 178)
175	Part of 178	Screw, Fun Retaining (Part of 178)
176	Part of 178	Felt, Motor (Part of 178)
177	Patr of 178	Spacer, Motor Shaft (Part of 178)
178	MOTOR-271	Motor
179	4TOK-22	Shaft, Motor Cushion
180	C-UKE	Cap, Motor Cushion Rubber
181	CUSHION	Cushion Rubber, Motor
182	4.3W10-0.8	Washer, Metal
183	COIL-ANGLE	Bracket, Hum Cancel Coil Retaining
186	MOTOR-ANG	Motor Chassis
187	ROD-271A	Rod, Cam Connecting from 191 to 193
188	ROD-271B	Rod, Cam Connecting from 191 to 93
189	4.1W8-0.4	Washer, Fiber
190	3.1W6-0.4	Washer, Fiber
191	CAM-PLATE C	Cam, Brake Arm Actuating, Take-up
192	SHAFT-271C	Shaft, Brake Arm Actuating Cam
193	CAM-PLATE B	Cam, Brake Arm Actuating, Supply
194	SPACER-271A	Sleeve, Brake Arm Actuating Cam
195	LEVER-271H	Lever, Idler Arm Actuating
196	CUT-SW-ANG	Plate, Auto-Shut-Off Switch
197	SPACER-271D	Spacer, Fiber
198	METAL-271B	Bearing, Reel Spindle
199	ANGLE-271A	Bracket, Function Shaft Retaining
200	MOLT-PLEN	Rod Cushion, Polyurethane
201	3M+20S	Screw, 3ϕ×20 mm
202	PCN-565	Printed Circuit Board
203	LOCK-COVER 120V set only	Interlock Cover, Fiber
204	110, 200, 220, 240V set only	Fuse, 1.2A
205	FH-102, 110, 200, 220, 240V set only	Fuse Socket
206	RADIATOR for #2495	Radiator, Transistor
207	2CAB-565	Cabinet, Wood, Complete
208	PANEL-565A	Deck Cover, Plastic
209	PANEL-565B	Pannel, Reel Deck, Aluminium
210	HEAD-COVER	Head Cover, Plastic
211	CO-WAKU	Counter Window
212	REEL-CAP	Reel Retainer
213	MTT-7	Empty Reel 7"
214	MTU-7A	Tape & Reel 7"
215	CONE-W565	Connecting Cord
216	3M+25S	Screw, Rubber Foot Retaining
217	3B+8S	Screw, Reel Panel Retaining
218	3MS+20S	Screw, Cabinet & Chassis Retaining
219	3.2W9-2.0	Washer, Metal, Cabinet Bottom

REF. NO.	PART NO.	DESCRIPTION

JACKS

J1, J2	(J-903)	Microphone Jack
J3, J4	(SO-923)	LINE IN Pin Jack
J5, J6	(SO-923)	LINE OUT Pin Jack

SEMICONDUCTORS

Q1, Q2	2SB-73	1st Audio Amplifier
Q3, Q4	2SB-75	2nd Audio Amplifier
Q5, Q6	2SB-77	3rd Audio Amplifier
Q7, Q8	2SB-77	Audio Output
Q9, Q10	2SB-156	Bias Oscillator, Matched Pair
Q11	2SB-77	Ripple Filter
SR1	SI-RECT-19	Power Rectifier
D1, D2, D3, D4	1N-34A	Meter Rectifier

TRANSFORMERS

T1, T2	7T-470	Output Transformer
T3	5T-536	Power Transformer (For 120 Volt Set)
T4	5T-537	Power Transformer (For 240, 220, 200, 110 Volt Set)

COILS

L1, L2	4L-938	Hum Cancel Coil
L3	4L-946	Dummy Coil, Erase Head
L4	4L-342B	Bias Oscillator Coil

VARIABLE RESISTORS

VR1, VR2	8V-569	Volume Control
VR3, VR4	8V-618	Sensitivity Adjustment
VR5, VR6	8V-723	Bias Current Adjustment

SWITCHES

S1, S2	4S-81	Record/Playt ack Switch, Slide Type
S3	8S-19	Playback Equalize, Lever Type
S4	8S-17	Record Equalize, Lever Type
S5	8S-15	Muting, Lever Type
S6	8S-99	Record Safety, Lever Type
S7	8S-43	Automatic Shut-Off, (120 Volt Set)
	9S-75	Automatic Shut-Off, (240, 220, 200, 110 Volt Set)
S8	8S-51	Power Switch (120 Volt Set)
	9S-87	Power Switch (240, 220, 200, 110 Volt Set)

MISCELLANEOUS

SO1	SO-971	Record/Playback Connector Socket
SO2	SO-219	Pilot Lamp Socket
P1	PG-194	Interlock Plug (120 Volt Set)
PL1	PL-504	Pilot Lamp, AC 6.3V, 0.2A
M1, M2	LEVEL-METER	Level VU Meter

REF. NO.	DESCRIPTION

RESISTORS

R1, R2	100 KΩ,	¼W,	10%,	Carbon
R3, R4	680 Ω,	¼W,	10%,	Carbon
R5, R6	470 KΩ,	¼W,	10%,	Carbon
R7, R8, R49, R50	27 KΩ,	¼W,	10%,	Carbon
R9, R10	2.7 KΩ,	¼W,	10%,	Carbon
R103, R104, R11, R12	100 Ω,	¼W,	10%,	Carbon
R13, R14	33 KΩ,	¼W,	10%,	Carbon
R15, R16, R31, R32	47 KΩ,	¼W,	10%,	Carbon
R17, R18, R37, R38, R39, R40	3.3 KΩ,	¼W,	10%,	Carbon
R19, R20	10 KΩ,	¼W,	10%,	Carbon
R21, R22, R33, R34	1.5 KΩ,	¼W,	10%,	Carbon
R23, R24	1 2 KΩ,	¼W,	10%,	Carbon
R25, R26	56 KΩ,	¼W,	10%,	Carbon
R27, R28	2.2 KΩ,	¼W,	10%,	Carbon
R29, R30, R57, R58	15 KΩ,	¼W,	10%,	Carbon
R35, R36	47 Ω,	¼W,	10%,	Carbon
R102	47 Ω,	¼W,	10%,	Carbon
R41, R42	6.8 KΩ,	¼W,	10%,	Carbon
R45, R46	8.2 KΩ	¼W,	10%,	Carbon
R47, R48, R101	820 Ω,	½W,	10%,	Carbon
R55, R56	820 Ω,	¼W,	5%,	Carbon
R43, R44	22 KΩ,	¼W,	10%,	Carbon
R51, R52	150 KΩ,	¼W,	10%,	Carbon
R53, R54, R59, R60	390 Ω,	½W,	10%,	Carbon
R61	22 Ω,	½W,	10%,	Carbon
R105	4.7 KΩ,	¼W,	10%,	Carbon
R106	4.7 KΩ,	½W,	10%,	Carbon
R107	80 Ω,	5W,	10%,	Carbon

CAPACITORS

C1, C2, C7, C8, C11, C12, C31, C32, C19, C20, C29, C30,	10μF,	10V,	Electrolytic
C3, C4	33μF,	6.3V,	Electrolytic
C5, C6, C13, C14	100μF,	6.3V,	Electrolytic
C9, C10	0.033μF,	50V,	Mylar
C15, C16	0.0015μF,	50V,	Mylar
C17, C18	0.5μF,	6V,	Aluminized
C21, C22	100μF,	16V,	Electrolytic
C23, C24	220μF,	16V,	Electrolytic
C25, C26	0.022μF,	50V,	Aluminized, 50V
C27, C28	10μF,	25V,	Electrolytic
C37, C38, C111	0.047μF,	50V,	Mylar
C33, C34, C35, C36	330PF,	50V,	Ceramic
C101, C102	0.0033μF,	50V,	Mylar 0.0033μF
C103	0.015μF,	50V,	Mylar 0.015μF
C104	220μF,	35V,	Electrolytic
C105	1000μF,	16V,	Electrolytic
C106	0.01μF,	50V,	Mylar
C107, C108	68PF,	50V,	Ceramic
C109	100μF,	35V,	Electrolytic
C110	470μF,	50V,	Electrolytic

Printed in Japan